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BUREAU OF TOPOGRAPHIC AND GEOLOGICAL SURVEY
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COAL RESERVES IN SOMERSET COUNTY, PENNSYLVANIA

By

John F. Reese

Introduction.

        In connection with the "Introduction to the Bituminous Coal
Fields of Pennsylvania" now being prepared for publication by the
Pennsylvania Geological Survey, coal reserves of the bituminous
fields are being computed by Mr. John F. Reese. In order to render
this information available at once without waiting for the uncertain
date of printing the report, an abstract of Mr. Reese's figures for
Somerset County is given herewith. All of the information readily
available at this time has been used in the computation, which
followed the methods used by the Land Classification Board of the
United States Geological Survey in its valuation of the public coal
lands. The results are given by beds for each township. For some
beds and for some areas the data are abundant and the results entire-
ly reliable. For other beds and areas the data are meager and the
results subject to revision as additional data are obtained. All the
data used and the computation sheets are permanently filed so that
modifications of the original figures can be made readily when re-
quired by additional information.

        The figures presented are preliminary and subject to correction
for any area when that area shall be studied in detail. In the mean-
time critical examination of the figures is invited in order that the
results may be made as accurate as possible. To that end the Survey
will welcome every bit of information not now in its possession.
Records of drillings and other data will be kept strictly confiden-
tial if so desired, although the Bureau naturally prefers to be able
to use data freely.

                                                George H. Ashley.

Coal Beds.

Somerset County contains nine coal beds that are now of economic interest. In order of present importance as shipping coals they are the Upper Kittanning, Lower Kittanning, Upper Freeport, Redstone, Pittsburgh, Lower Freeport, Clarion, Sewickley, and Brookville.

In this report, the coals of the Berlin district which have been recently correlated by members of this Survey, are considered and computed according to the following table:

Coal beds in Berlin district.

Sewickley (or Tyson) coal - - - - - - - - -No. 1 Berlin coal
Redstone coal - - - - - - - - - - - - - - -Platt coal
Lower bench Redstone   )
        or   ) - - - - - - - - -Coal on Coleman farm
Pittsburgh Rider coal)
Pittsburgh coal - - - - - - - - - - - - - -No. 2 Price coal

It is to be understood that the correlations assumed here are subject to correction when more detailed geological work is completed.

Upper Kittanning coal. The extensive mining development and outcrop of this bed, and a fair number of core drill records have furnished many measurements of its thickness and evidence of its persistency. This makes possible a fairly accurate estimate of the quantity of coal in the bed. In the Wellersburg field, and south of Meyersdale where the data are meagre, an average thickness of 30 inches has been assumed. This bed is thickest in Jenner and Conemaugh townships, ranging from 38 to 87 inches.

The Upper Kittanning is the most persistent bed, contains the greatest coal reserve, and is the largest producer within the county, yielding more than 4,100,000 tons annually.

Lower Kittanning coal. A fair amount of information as to the thickness and persistency of this bed throughout the northern half of the county is available. In the southern part data are meagre except where coal is mined. Little is known as to the extent and thickness of the beds over large areas, and a general average based on thicknesses in surrounding areas was used in computing quantity.

The Lower Kittanning is best suited to mining in Conemaugh, Paint, Shade, and Quemahoning townships, with a thickness range of 36 to 58 inches. In Brothers Valley township it is 42 to 62 inches thick on the eastern side of the Berlin Basin. On the western side of the basin in Brothers Valley and Stony Creek townships core drill records show this bed ranging from o to 10 inches in thickness.

The Lower Kittanning bed contains the second greatest reserve within the county, and ranks second in production with a total of over 3,800,000 tons annually.

Upper Freeport Coal. The extensive outcrop of this bed through-
out the county and the mines in various localities furnish enough
measurements to make possible a fairly accurate estimate of quantity.

This coal attains its best development in Jenner, Conemaugh,
Lincoln, Somerset and Quemahoning townships with a thickness range
of 34 to 71 inches. No information is available as to the extent
and thickness of the Upper Freeport coal under large areas in the
townships south of Somerset, and a general average based on thick-
nesses in surrounding areas was used. The percentage of this bed
that can be recovered is governed by the sequence in which the Upper
and Lower Freeport coals are mined. If the Lower Freeport bed is
worked first and pillars are drawn, the overlying rocks will cave
and break the Upper Freeport bed, thereby causing a partial and in
many places complete loss of that coal.

The Upper Freeport coal is third in size of reserve within the
county, and ranks third in production with a total of over 840,000
tons annually.

Redstone coal. An accurate estimate of the quantity of coal
in the Redstone bed is made possible by many measurements at mines
and outcrop. The mines are in Summit and Elk Lick townships. The
Platt coal of the Berlin area has been correlated as the Redstone
coal, but little being known of its extent and thickness, it is not
included in these reserves. A conservative percentage of recovery
has been used in computing the recoverable tonnage, because most of
the underlying Pittsburgh coal has been mined and the pillars drawn,
causing the intervening rocks to cave and break this bed, making it
difficult and costly to mine.

The Redstone bed is eighth in size of reserve within the county,
and ranks fourth in production with a total of over 670,000 tons
annually.

Pittsburgh coal. The extensive development and outcrop of
this bed furnish much information as to its extent and thickness.
Pittsburgh coal has been mined so many years in Summit and Elk Lick
townships that it is practically exhausted. In Southampton,
Brothers Valley and Jenner townships this coal has been developed in
recent years. Brothers Valley township contains the largest reserve.

The No. 2 Price coal of the Berlin area in Brothers Valley town-
ship has been correlated as the Pittsburgh coal and is computed as
such in this report. From drill hole records and outcrop, the
writer has been enabled to define fairly accurately the extent of
this bed. The area as defined is subject to correction when more
information is available from future prospecting and development.

As computed, the Pittsburgh bed is seventh in size of reserve
in the county, and ranks fifth in production with a total of over
420,000 tons annually.

Lower Freeport coal. A fair amount of information is available
as to the extent and thickness of this coal. It is thickest in
Somerset and Quemahoning townships, and because of its exceptionally

fine quality in the vicinity of Friedens, it is in great demand as a smithing coal.

As this bed is extremely variable in thickness and persistency, it has been considered as a reserve only in areas contiguous to mines or to drill holes that prove it to be of workable thickness. A low percentage of recovery has been assumed because the bed is so irregular.

The Lower Freeport coal as computed in this report is fourth in size of reserve within the county, and ranks sixth in production, yielding over 174,000 tons annually.

Clarion coal. This coal has been computed as of economic interest in six townships, namely Addison, Black, Milford, Paint, Somerset, and Upper Turkey Foot. Little is known of its thickness and extent, and only areas surrounding development or proven ground have been computed.

Future prospecting may enlarge these areas, but information is meagre at the present time. The Clarion coal is thickest in Black township, ranging from 40 to 58 inches. This coal is extremely variable and is broken by partings. Therefore a low recoverable percentage was used in these computations.

The Clarion coal seems to be sixth in size of reserve in the county, and ranks seventh in production with a total of over 87,000 tons annually.

Sewickley coal. The No. 1 Berlin coal in Brothers Valley township has been correlated as the Sewickley coal, and is computed as such in this report.

From drill hole records and outcrop the writer has been able to define fairly accurately the extent of this bed. The area as defined is subject to correction when future prospecting and development furnish more information.

The Sewickley coal is mined only in Brothers Valley township in the vicinity of Pine Hill where it averages 44 inches thick.

As defined and computed herein, the Sewickley coal is ninth in size of reserve within the county, and ranks eighth in production with a total of over 81,000 tons annually.

Brookville coal. This bed has been computed as of economic interest in six townships, namely Black, Brothers Valley, Elk Lick, Milford, Somerset, and Summit.

Data are meagre as to its thickness and extent, and it has been considered as existing only in areas contiguous to localities where mined. The Brookville coal is 30 to 36 inches thick in Black and Somerset townships.

As computed herein, the Brookville coal is fifth in size of reserve within the county, and ranks ninth in production, yielding over 68,000 tons annually.

Method of Computing Reserves.

A base map for each coal bed was made by tracing its outcrop from the geological map of the county made by the Second Pennsylvania Survey, with township boundaries and outcrop lines corrected according to latest maps available. All available measurements of a coal bed, gathered from Federal and State reports, mine maps, core drill records and personal inspections, were plotted on the map of that coal bed at the locality represented. By studying the distribution of the figures, areas of equal thickness were plotted, and by means of a planimeter, an instrument for measuring plane areas, the area of each coal bed in each township was measured. The unit used for calculating the quantity of coal was 90,000 short tons per inch of bed per square mile of area.

Worked-out areas were determined from mine maps and plotted to scale on the base maps. The same method as above was used for computing the quantity of coal extracted.

For some localities, no information is available as to the mined out areas of the various beds computed herein. For these places, an estimate of probable depletion has been made, based on age and size of operation, or on the difference between original areas and statements of acreages remaining unmined.

Having calculated the quantity of coal originally contained within the area of any bed and subtracted the quantity already mined out, the writer determined from engineering experience the probable percentage of each bed which could be recovered in different localities. This varies from 60 to 90 per cent, depending on the thickness and character of the bed. The quantity of coal computed to be in any bed, multiplied by the assumed percentage of recovery, less 15 per cent for loss in mining, gives the estimated recoverable tonnage.

Coal Reserves.

The area of Somerset County is 949.4 square miles.

The result of computing the coal reserves in Somerset County based on the latest maps, engineering data, and methods is shown in the accompanying tables.

One table gives the estimated recoverable tonnage by beds and townships. The figures have been given as computed. It should however be distinctly understood that while the acreage of each of the beds has been accurately computed, the reliability of the average thickness of the coals used in the computation of tonnage decreases for the beds in the order following: Pittsburgh, Redstone, Sewickley, Upper Kittanning, Lower Kittanning, Upper Freeport, Lower Freeport, Clarion, and Brookville. Thus, while the figures for the Pittsburgh bed are conservative and probably reliable, the figures for the Brookville coal may be much too small or many times too large.

Summary of Recoverable Coal in Somerset County in Short Tons.

Township	Sewickley	Redstone	Pittsburgh	U.Freeport	L.Freeport
Addison	------	------	------	19,000,000	2,200,000
Black	------	------	------	4,000,000	6,600,000
Brothers Vy.	3,400,000	------	10,400,000	12,400,000	20,100,000
Conemaugh	------	------	------	55,700,000	------
Elk Lick	------	4,100,000	3,200,000	25,800,000	14,600,000
Fair Hope	------	------	------	------	------
Jefferson	------	------	------	30,500,000	------
Jenner	------	------	900,000	86,000,000	3,600,000
Lincoln	------	------	------	40,300,000	9,000,000
L.Turkey Ft.	------	------	------	13,300,000	------
Middle Crk.	------	------	------	16,500,000	2,400,000
Milford	------	------	------	7,400,000	10,000,000
Ogle	------	------	------	------	------
Paint	------	------	------	3,200,000	6,500,000
Quemahoning	------	------	------	37,100,000	29,200,000
Shade	------	------	------	19,700,000	11,400,000
Somerset	------	------	------	56,100,000	46,000,000
Southampton	------	------	600,000	8,100,000	------
Stony Creek	------	------	------	36,200,000	38,000,000
Summit	------	1,300,000	1,000,000	24,700,000	10,200,000
U.Turkey Ft.	------	------	------	29,700,000	9,800,000
Total	3,400,000	5,400,000	16,100,000	525,700,000	219,600,000

Township	U.Kittng.	L.Kittng.	Clarion	Brookville	Total
Addison	74,000,000	34,000,000	4,100,000	----	133,300,000
Black	15,500,000	11,700,000	29,500,000	23,000,000	90,300,000
Brothers Vy.	90,500,000	62,900,000	------	6,400,000	206,100,000
Conemaugh	95,500,000	81,900,000	------	----	233,100,000
Elk Lick	27,500,000	33,100,000	------	2,700,000	111,000,000
Fair Hope	----	500,000	------	----	500,000
Jefferson	35,100,000	34,100,000	------	----	99,700,000
Jenner	1,254,600,000	109,000,000	------	----	1,454,100,000
Lincoln	46,000,000	33,500,000	------	----	128,800,000
L.Turkey Ft.	30,700,000	20,800,000	------	----	64,800,000
Middle Crk.	27,700,000	26,100,000	------	----	72,700,000
Milford	46,200,000	36,100,000	4,800,000	7,000,000	111,500,000
Ogle	400,000	2,900,000	------	----	3,300,000
Paint	27,200,000	37,600,000	9,500,000	----	84,000,000
Quemahoning	49,500,000	54,200,000	------	----	170,000,000
Shade	69,900,000	77,000,000	------	----	178,000,000
Somerset	90,100,000	86,900,000	4,000,000	18,300,000	301,400,000
Southampton	12,200,000	16,500,000	------	----	37,400,000
Stony Crk.	99,200,000	83,700,000	------	----	257,100,000
Summit	34,800,000	32,400,000	------	5,500,000	109,900,000
U.Turkey Ft.	61,900,000	35,800,000	2,700,000	----	139,900,000
Total	2,188,500,000	910,700,000	54,600,000	62,900,000	3,986,900,000

Coal Reserves in Somerset County, in Short Tons.

Coal beds	Original Deposit	Mined Out	Recoverable
Sewickley	8,700,000	3,600,000	3,400,000
Redstone	15,400,000	7,400,000	5,400,000
Pittsburgh	51,000,000	29,504,000	16,100,000
U. Freeport	866,600,000	7,380,000	525,700,000
L. Freeport	370,100,000	1,540,000	219,600,000
U. Kittanning	3,086,500,000	84,050,000	2,188,500,000
L. Kittanning	1,500,200,000	52,400,000	910,700,000
Clarion	89,800,000	750,000	54,600,000
Brookville	103,500,000	760,000	62,900,000
Total	6,091,800,000	187,384,000	3,986,900,000

The foregoing summary tables were prepared from the following tables which give the details by townships. The figures in the second column represent the area of each coal bed in square miles. A blank space in the fourth column indicates that the coal bed has not been mined commercially within the township. The fifth column is the percentage of the total thickness of the bed estimated as recoverable, from which should be subtracted in all cases 15 per cent for loss in mining. This gives the quantity computed as recoverable, shown in the sixth column. The range in thickness of the coal beds in inches is given in the last column.

All the coal beds in the county are accessible by drift mines.

COAL RESERVES BY TOWNSHIPS, IN SHORT TONS.

ADDISON TOWNSHIP   Area 56.3 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	16.4	36,100,000	---	60	19,000,000	24-30
L. Freeport	1.7	4,400,000	---	60	2,200,000	24-34
U. Kittanng	23.6	98,400,000	1,600,000	90	74,000,000	34-60
L. Kittanng	22.0	66,600,000	---	60	34,000,000	30-34
Clarion	3.0	8,100,000	---	60	4,100,000	30
Total		213,600,000	1,600,000		133,300,000	

BLACK TOWNSHIP — Area 34.1 Square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	2.1	6,000,000	60,000	80	4,000,000	24-36
L. Freeport	3.1	9,700,000	---	80	6,600,000	34-36
U. Kittanng	4.6	20,700,000	450,000	90	15,500,000	46-60
L. Kittanng	7.6	20,500,000	800,000	70	11,700,000	28-40
Clarion	12.9	44,000,000	550,000	80	29,500,000	30-58
Brookville	13.3	35,600,000	700,000	80	23,000,000	30-36
Total		136,500,000	2,560,000		90,300,000	

BROTHERS VALLEY TOWNSHIP — Area 56.5 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
Sewickley	2.2	8,700,000	3,600,000	80	3,400,000	44
Pittsburgh	5.6	14,900,000	1,200,000	90	10,400,000	46
U. Freeport	14.7	24,400,000	---	60	12,400,000	24-30
L. Freeport	11.8	29,900,000	200,000	80	20,100,000	24-34
U. Kittanng	39.5	134,900,000	1,800,000	80	90,800,000	24-54
L. Kittanng	30.0	95,600,000	3,000,000	80	62,900,000	28-60
Brookville	4.6	12,700,000	---	60	6,400,000	30-34
Total		321,100,000	9,800,000		206,100,000	

CONEMAUGH TOWNSHIP — Area 37.5 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	20.3	82,400,000	360,000	80	55,700,000	34-68
U. Kittanng	29.4	136,700,000	11,800,000	90	95,500,000	36-66
L. Kittanng	30.7	113,700,000	6,600,000	90	81,900,000	36-48
Total		332,800,000	18,760,000		233,100,000	

ELK LICK TOWNSHIP — Area 53.6 Square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
Redstone	2.5	11,700,000	5,600,000	80	4,100,000	52
Pittsburgh	3.6	25,200,000	21,000,000	90	3,200,000	78
U. Freeport	21.0	50,700,000	30,000	60	25,800,000	24-30
L. Freeport	8.7	21,800,000	300,000	80	14,600,000	24-34
U. Kittanng	20.0	54,000,000	---	60	27,500,000	30
L. Kittanng	26.0	65,000,000	---	60	33,100,000	28
Brookville	2.0	5,400,000	---	60	2,700,000	30
Total		233,800,000	26,930,000		111,000,000	

FAIR HOPE TOWNSHIP — Area 14.2 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
L. Kittanng	.4	1,000,000	---	60	500,000	30

JEFFERSON TOWNSHIP — Area 37.5 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	15.6	51,400,000	---	70	30,500,000	36-40
U. Kittanng	16.0	59,000,000	---	70	35,100,000	40-44
L. Kittanng	21.0	57,400,000	---	70	34,100,000	30-34
Total		167,800,000	---		99,700,000	

JENNER TOWNSHIP — Area 61.0 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
Pittsburgh	.4	1,400,000	4,000	80	900,000	40
U. Freeport	29.0	129,100,000	2,500,000	80	86,000,000	24-68
L. Freeport	1.7	5,500,000	60,000	80	3,600,000	24-36
U. Kittanng	34.4	1,682,000,000	41,900,000	90	1,254,600,000	36-72
L. Kittanng	40.8	142,600,000	----	80	109,000,000	28-60
Total		1,960,600,000	44,464,000		1,454,100,000	

LINCOLN TOWNSHIP — Area 24.2 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	15.8	60,400,000	1,000,000	80	40,300,000	40-44
L. Freeport	5.9	15,200,000	----	70	9,000,000	24-36
U. Kittanng	16.5	66,100,000	5,900,000	90	46,000,000	40-50
L. Kittanng	18.4	56,600,000	200,000	70	33,500,000	34-36
Total		198,300,000	7,100,000		128,800,000	

LOWER TURKEY FOOT TOWNSHIP — Area 34.0 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	9.6	26,100,000	----	60	13,300,000	24-36
U. Kittanng	14.2	45,500,000	300,000	80	30,700,000	34-46
L. Kittanng	15.0	40,800,000	----	60	20,800,000	30-34
Total		112,400,000	300,000		64,800,000	

MIDDLE CREEK TOWNSHIP — Area 28.4 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	10.0	32,400,000	---	60	16,500,000	36
L. Freeport	2.0	4,800,000	---	60	2,400,000	24-30
U. Kittanng	12.6	46,600,000	---	70	27,700,000	36-60
L. Kittanng	19.0	51,300,000	---	60	26,100,000	30
Total		135,100,000	---		72,700,000	

MILFORD TOWNSHIP — Area 24.5 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	5.8	14,600,000	---	60	7,400,000	24-36
L. Freeport	6.4	17,000,000	30,000	70	10,000,000	24-36
U. Kittanng	19.9	77,800,000	---	70	46,200,000	40-60
L. Kittanng	22.2	60,700,000	---	70	36,100,000	30-42
Clarion	3.0	8,100,000	---	70	4,800,000	30
Brookville	4.4	12,000,000	60,000	70	7,000,000	30-34
Total		190,200,000	90,000		111,500,000	

OGLE TOWNSHIP — Area 31.6 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Kittanng	.2	800,000	200,000	80	400,000	48
L. Kittanng	1.1	4,200,000	300,000	90	2,900,000	42-50
Total		5,000,000	500,000		3,300,000	

PAINT TOWNSHIP — Area 30.7 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	2.1	6,400,000	---	60	3,200,000	34
L. Freeport	6.0	12,900,000	---	60	6,500,000	24
U. Kittanng	11.2	43,200,000	7,600,000	90	27,200,000	36-48
L. Kittanng	19.8	73,800,000	24,600,000	90	37,600,000	28-56
Clarion	3.0	16,200,000	200,000	70	9,500,000	60
Total		152,500,000	32,400,000		84,000,000	

QUEMAHONING TOWNSHIP — Area 26.4 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	15.9	54,900,000	300,000	80	37,100,000	34-48
L. Freeport	18.6	57,400,000	---	60	29,200,000	24-36
U. Kittanng	20.5	69,200,000	4,400,000	90	49,500,000	34-46
L. Kittanng	23.1	80,600,000	800,000	80	54,200,000	34-54
Total		262,100,000	5,500,000		170,000,000	

SHADE TOWNSHIP — Area 63.5 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	9.2	29,500,000	400,000	80	19,700,000	34-36
L. Freeport	8.6	22,400,000	---	60	11,400,000	24-40
U. Kittanng	25.0	91,900,000	500,000	90	69,900,000	36-44
L. Kittanng	27.4	116,400,000	15,800,000	90	77,000,000	36-80
Total		260,200,000	16,700,000		178,000,000	

SOMERSET TOWNSHIP — Area 55.9 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
U. Freeport	26.0	85,200,000	2,600,000	80	56,100,000	30-44
L. Freeport	24.6	68,300,000	800,000	80	46,000,000	24-48
U. Kittanng	37.5	139,100,000	6,600,000	80	90,100,000	30-60
L. Kittanng	48.9	146,400,000	300,000	70	86,900,000	28-38
Clarion	3.0	8,000,000	----	60	4,000,000	30
Brookville	9.3	27,000,000	----	80	18,300,000	30-36
Total		474,000,000	10,300,000		301,400,000	

SOUTHAMPTON TOWNSHIP — Area 26.3 square miles

Coal beds	Area (sq. mi.)	Original deposit	Mined out	Per cent mineable	Recoverable	Thickness in inches
Pittsburgh	.2	1,100,000	300,000	90	600,000	62
U. Freeport	6.0	16,000,000	----	60	8,100,000	30
U. Kittanng	9.0	24,000,000	----	60	12,200,000	30
L. Kittanng	12.0	32,400,000	----	60	16,500,000	30
Total		73,500,000	300,000		37,400,000	